

NEBRASKA Statewide Wireless Communication System

Report to the Nebraska Legislature

Department of Administrative Services

Division of Communications

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NEVCOM Public Safety Communication System

The Nebraska Virtual Communications network (NEVCOM) is the concept for a new state-of-the-art radio system to vastly improve and update communications for Nebraska's state and local public safety entities. After a comprehensive needs analysis¹, the Department of Administrative Services Division of Communications published a Request for Proposal as part of a competitive bid process for the communication system and associated managed services and equipment. This report presents the costs and financial options, the necessary elements for implementing the system, and sustaining its growth, and the management structure for participation as offered in the recommended proposal.

Preface

Nebraska Revised Statute 86-1803 through 86-1811, as established by LB446 (1999), outlines the Legislature's instructions to the Department of Administrative Services Division of Communications (DOC) for planning a statewide public safety wireless communications system for state agencies and other Nebraska public safety entities. The Nebraska Virtual Communications network (NEVCOM) connotes a statewide land mobile radio system intended to serve the needs of public safety and public service agencies at all levels throughout Nebraska. The system described herein was chosen by a panel of independent evaluators as the best overall solution offered by competing vendors. An independent consultant performed a comprehensive needs analysis—the basis for the radio system design—in 2000. A Request for Proposal (RFP) was issued through the Department of Administrative Services Materiel Division. The independent evaluators forwarded the results and recommendation to award to Materiel Division, which issued the Notice of Intent to Award on January 4, 2002 to Motorola, Inc. As specified in the RFP (1.4.3 RFP Authorization) an interlocal agency comprised of governmental entities will sign and administer the contract after the funding method is determined. This report presents the costs and details of implementing and managing the system as established in Motorola's proposal.

Project Scope & System Overview

As of the time of this writing, a contract has not been signed. As explained above, the funding method will be determined, and then a contract will be signed by an interlocal agency comprised of government agencies. The Division of Communications is finalizing issues with the vendor regarding technical details and implementation of the system. The vendor proposal is for a complete “turnkey” system design for the radio system infrastructure including, project management, coordination with state telecommunications management, subscriber equipment, training, and ongoing support services. These contract elements for the system are explained in the following paragraphs.

The proposed new communication system is a state-of-the-art VHF digital trunked radio system, capable of serving public safety agencies throughout the state on a single common infrastructure, and providing at least 95% territorial coverage of the state. It is unprecedented in Nebraska that public safety agencies of every jurisdiction will have

¹ Wireless Communication Plan for Nebraska, December 2000

opportunities to participate in a consolidated radio system, which has been initially scaled to cost-effectively support the anticipated users and projected growth. In addition, technologies such as mobile data may be added to the system when required, and the design includes expansion capabilities to meet future capacity and coverage requirements. State, local and federal public safety entities have expressed interest and urgency in the ability to participate in the statewide consolidated communication system. When implemented and upon test acceptance, the new communication system will afford a variety of possibilities for state, local and federal agencies to interoperate. Daily activities and emergency responses will be greatly enhanced across all participating jurisdictions. Technical means are available to interface with the new system, thus minimizing the need for wholesale replacement of viable local systems. The system will also be able to accommodate a variety of third party vendor equipment, providing numerous end-user options and pricing tiers; i.e. subscriber equipment is not sole-source limited.

Communication System Plan

Implementing a large and complex communication system on a statewide basis requires substantial expertise in telecommunications management, business management and technical skill sets unique to public safety radio communications. Successful implementation will require ongoing coordination between the contracting entity and vendor. Continual performance monitoring is required, as is the escalation plan, for maintenance and mitigating system failures.

System Implementation

The vendor proposal outlined the implementation schedule through December 2004. Finalization of issues are currently under discussion with the vendor that will impact details of the system and the proposed timeline.

Key System Components

NEVCOM consists of two complimentary components: a Wide Area Radio Network (WARN), and the Nebraska Event-based Tactical network (NEVTAC). Each plays a critical role in the enhancement of the capability of Nebraska public safety agencies to protect and serve its citizens.

WARN

The Wide Area Radio Network is a comprehensive, integrated, interoperable radio communications network designed to provide virtually seamless radio coverage within and throughout Nebraska right to its borders for all participating state and local agencies. Capacity requirements were projected out ten years in a comprehensive consulting study. The WARN system, when commissioned at the close of 2004, will begin life with capacity for year five as designed, and be incrementally expandable for the next five years and beyond.

WARN is an all-new radio system consisting of: (1) base station transmission equipment strategically located at approximately fifty-six transmission sites throughout the state and the Network Operations Center (NOC), a nexus of control equipment located in Lincoln (system monitoring is replicated at the vendor's headquarters for backup); (2) information transport infrastructure provisioned through telecommunications service providers for interconnectivity among the transmission sites and the NOC; and (3) subscriber equipment —mobile and portable radios —for use by public safety agency personnel on the new system.

NEVTAC

The Nebraska Event-based Tactical network knits together legacy radio communications systems already in place throughout Nebraska. NEVTAC was conceived to make the best use of viable existing systems having years of remaining useful life by electronically interconnecting these systems during events and emergencies requiring on-the-scene (tactical) interoperability. Whereas WARN is a comprehensive statewide implementation, by contrast NEVTAC is a voluntary, local-area undertaking. Once established, NEVTAC networks may interconnect with the statewide WARN network for complete interoperability throughout the state.

Interconnecting existing base stations and consoles with “intelligent” control equipment creates NEVTAC networks. This enables authorized system control personnel to tie together two or more stations directly from a field radio immediately as needed. When the event is closed, the interconnected system is just as easily disconnected for routine use as normal.

Telecommunications Transport

Telecommunications transport service is required to each radio tower site and back to the master control facility (NOC). The transport costs presented in this report reflect current tariff rates quoted from multiple service providers. As the point of executing a contract nears, the Division of Communications anticipates cost reductions to be realized through long-term agreements with the state’s service providers. In addition, some cost reductions may be realized through technical modifications with the vendor. Contracts for the transport infrastructure suppliers are to be determined, although quotations were solicited and received from Alltel, Sprint, and Qwest.

Participation & Long Term Growth

State & Local Agency Migration

Migrating new users to the system is vital for economy of scale, beginning with the initial anchor tenants, such as state law enforcement. The new system will provide the necessary capabilities crucial to public safety users. An ongoing migration and implementation strategy is necessary for new agencies that elect to join the system. Many local entities have expressed interest in participating. Local and federal entities will have a variety of options for joining the system, which will help meet local demands and begin to reduce reliance on older legacy radio systems and technologies. The system is designed for accommodating multiple jurisdictions at all levels effectively and efficiently.

State law enforcement agencies are anticipated to comprise the initial group of users, in addition to a projected number of local users. State users generally operate over large geographic regions, while local entities require county or citywide access. This mix of operational jurisdictions will be supported on the system.

Other Considerations

The Wireless Communication Plan for Nebraska addresses key issues regarding staffing recommendations to support the system and shared user governance of the communication system. It should be noted that proper staffing levels are necessary to support the complex system operations and development. It has also been proposed that shared governance of the system should be established through a User Governance Board to properly address system development and user issues.

FTEs and Staffing

4.5 professional and support staff positions are anticipated to be the minimum staff required to support the system functions. This includes ongoing project management, system database administration, coordinating and securing grant opportunities, and support staff.

User Governance Board

A NEVCOM Board comprised of public safety users will ensure representation of all system stakeholders regarding critical decisions concerning growth, operating policies, and grant opportunities.

Financial Options Presented

Contract award is contingent on approval of a funding method. The attached Composite Cost Summary was created to tabulate and compare the costs of the equipment and service categories provided by Motorola under their purchase and lease purchase arrangements. Note that the numbers of subscriber units are based on the growth projections published in the Wireless Communication Plan for Nebraska. Although it is not included in the attached Composite Cost Summary, the vendor has included in their price proposal (under a purchase arrangement) a discount of \$1M on the infrastructure with the purchase of a specific quantity of subscriber units within a specified time.

NEVCOM System Cost Analysis

As noted above, NEVCOM involves two components: WARN and NEVTAC. Both elements are vital to improving public safety radio communications throughout the state; they are complimentary methods to both enhance the functionality of existing legacy systems (and effectively extend their useful lives), as well as providing new, reliable and efficient technology and capacity for coordinated and more effective law enforcement efforts.

Furthermore, since each aggregate of legacy radio equipment is unique, technical solutions and therefore costs of each NEVTAC implementation will be unique. No projections of NEVTAC costs are included herein. Prices shown are direct purchases using scheduled release and billing upon acceptance.

Separability

As noted in the System Implementation section above, WARN has three main elements: radio transmission facilities, information transport interconnectivity, and subscriber units. These elements are not technically bundled and may be procured (and funded) separately. Although the vendor offers various tiers and price ranges of subscriber equipment, there are multiple third party vendors that also offer equipment capable of being used on the system. The system design is open architecture wherein multiple vendors offer subscriber equipment capable of operating successfully on the common radio infrastructure. User agencies are therefore not bound by technical reasons to procure their subscriber units from the infrastructure supplier.

Radio System Infrastructure

The WARN infrastructure includes the tower sites, base station radio equipment, system management and control facilities and the costs of the personnel required to install, maintain and operate the system. Figures shown are for outright purchase and lease-purchase options. The tangible and intangible items below are bundled and supplied on a turnkey basis by the chosen infrastructure vendor, Motorola.

Tangibles

This comprises WARN system components and related radio channels (base stations and related equipment) located at tower transmission sites, primarily leased existing towers. This category includes: common initial infrastructure equipment, site-specific initial infrastructure, and equipment to provide enhanced portable radio coverage.

Intangibles

This comprises WARN system implementation labor and on-going control and supervisory personnel, including training and documentation, system maintenance, and management planning and support.

Telecom Infrastructure

Each radio transmission site in the WARN system is connected to the operations center (NOC) in Lincoln via wide-bandwidth data lines. The Motorola system design specifies fractional and full T1 bandwidth to distribute audio, data, and control information throughout the system using Voice Over Internet Protocol (VoIP). Fractional T1 service is not offered in Nebraska, therefore full T1 service to each tower site must be purchased. This will result in

over-capacity lines (and cost) in certain instances. Qwest and Alltel proposed networks using concentrators (data funnels) to reduce the overall costs involved.

Telco Equipment

The telecom providers require the initial purchase of specialized telco-side equipment to provision the WARN network, and charge for the network on a monthly basis. The initial equipment purchase and monthly recurring expenses are shown in the Composite Cost Summary.

The WARN network also requires the initial purchase of specialized customer-side equipment to condition the WARN network interconnection to the radio infrastructure. The telecom vendors maintain this equipment. These monthly costs are also included in the Composite Cost Summary.

Subscriber Radio Equipment

Public safety agency personnel access the WARN system using either vehicle radios or portable radios or both in some cases. Legacy radios are not applicable to the WARN system. All require purchase as new units. Subscriber unit costs are shown in the Composite Cost Summary under the assumed quantities described below.

Mobile Radios

The RFP required quotes for low, medium, and high-tier functionality mobile radios to provide user agencies with a variety of pricing levels. The consulting study projected 4,823 mobile radios to be in use by the fifth year, assuming a mix of 10% low-tier, 80% mid-tier, and 10% high-tier models. The figures shown in the attached Composite Cost Summary reflect this quantity and mix for typical configurations of each model offered by the vendor (Motorola).

Portable Radios

As with the mobile radios above, the RFP also required quotes for low, medium, and high-tier functionality portable radios to provide user agencies with a variety of pricing levels. The consulting study also projected 4,823 portable radios to be in use by the fifth year, assuming a mix of 10% low-tier, 80% mid-tier, and 10% high-tier models. The figures shown in the attached Composite Cost Summary reflect this quantity and mix for typical configurations of each model offered by the vendor (Motorola).

Composite Cost Summary

	Non-Recurring Costs	Monthly Recurring Costs
Outright Purchase Option		
STATEWIDE RADIO SYSTEM	82,378,755.15	74,292.07
Radio System Infrastructure	55,348,377.04	
Tangibles	43,597,711.04	
Intangibles	11,750,666.00	
Telecom Infrastructure	55,109.86	74,292.07
Telco Equipment	40,109.86	72,592.07
Subscriber Equipment	15,000.00	1,700.00
Subscriber Radio Equipment	26,975,268.25	
Mobile Radios	14,208,839.25	
Portable Radios	12,766,429.00	

	Non-Recurring Costs	Monthly Recurring Costs
Lease-Purchase Option		
STATEWIDE RADIO SYSTEM	88,346,726.96	74,292.07
Radio System Infrastructure	61,316,348.85	
Tangibles	49,806,555.85	
Intangibles	11,509,793.00	
Telecom Infrastructure	55,109.86	74,292.07
Telco Equipment	40,109.86	72,592.07
Subscriber Equipment	15,000.00	1,700.00
Subscriber Radio Equipment	26,975,268.25	
Mobile Radios	14,208,839.25	
Portable Radios	12,766,429.00	

Financing Assumptions: (1) Tax-exempt lease-purchase agreement with \$1 buyout option, (2) includes all and only Motorola-supplied equipment plus installation and training labor, (3) a composite of four separate, cascaded 5 year term leases, with annual payments in arrears, payable through project Years 2 through 8 inclusive, computed using a 4.70% "indicative rate" subject to indexing to the average life AAA Municipal Market Data until funding, (4) offered through Motorola Credit Corp., assignable to Koch Financial Corp.